CLAIMS

What is claimed is:

1. A wireless receiver circuit comprising:

a first receiver operative to receive a wireless signal and an interference product signal;

a second receiver operative to detect an interference blocker signal associated with the interference product signal; and

multi-receiver control and interference detection logic, operatively coupled to the first and second receivers to simultaneously control the second receiver to detect the interference blocker signal while the first receiver receives at least a portion of the wireless signal and the interference product signal,

wherein in response to the interference blocker signal detected by the second receiver, the second receiver provides interference blocker data to the multi-receiver control and interference detection logic, and wherein in response to the interference blocker data provided to the multi-receiver control and interference detection logic by the second receiver, the multi-receiver control and interference detection logic adjusts at least one operating condition of the first receiver such that the interference product signal received by the first receiver is reduced.

2. The wireless receiver circuit of claim 1, further including:

an amplifier, operatively coupled to the first receiver and to the second receiver to provide the wireless signal and the interference product signal to the first receiver, and to provide the interference blocker signal to the second receiver, and wherein in response to an interference blocker search signal provided to the second receiver by the multi-receiver control and interference detection logic and also in response to the interference blocker signal detected by the second receiver and the interference blocker data provided to the multi-receiver control and interference detection logic by the second receiver, the multi-receiver control and interference detection logic is also operatively coupled to the amplifier to provide a mitigation control signal to adjust at least one operating condition of the amplifier and of the first receiver.

3. The wireless receiver circuit of claim 1, wherein the multi-receiver control and interference detection logic is operative to provide an interference blocker search signal to control the second receiver to detect a second interference blocker signal, and in response, the multi-receiver control and interference detection logic provides a mitigation control signal to the first receiver to adjust at least one of a first and a second operating condition of the first receiver to reduce the interference product signal received by the first receiver.

4. The wireless receiver circuit of claim 1, wherein the first receiver is operative to provide to the multi-receiver control and interference detection logic, first receiver data corresponding to a signal quality metric associated with the wireless signal, wherein if the signal quality metric detected by the first receiver exceeds a threshold, the

multi-receiver control and interference detection logic provides an interference blocker search signal to direct the second receiver to search a frequency band and to detect the interference blocker signal within the frequency band.

5. The wireless receiver circuit of claim 1, wherein the multi-receiver control and interference detection logic is operative to control the second receiver to detect a signal level at a frequency located in at least a portion of a frequency band by at least one of searching the frequency band and tuning to a candidate blocker frequency, such that the portion of the frequency band is eliminated as including the interference blocker signal if the detected signal level is below a threshold level, and the portion of the frequency band includes the interference blocker signal if the detected signal level is above the threshold level.

6. The wireless receiver circuit of claim 1, wherein the at least one operating condition of the first receiver is at least one of a radio frequency operating condition, an intermediate frequency operating condition and a baseband operating condition.

7. The wireless receiver circuit of claim 1, wherein if the second receiver ceases to detect the interference blocker signal, the second receiver provides corresponding interference blocker data to the multi-receiver control and interference detection logic and in response, the multi-receiver control and interference detection logic is operative to provide a corresponding mitigation control signal to the first receiver to remove the adjustment of the at least one operating condition of the first receiver.

8. The wireless receiver circuit of claim 1, wherein the multi-receiver control and interference detection logic is operative to provide an interference blocker search signal to adjust the at least one operating condition of the first receiver in response to at least one of a transmit power level, a transmitter activation indication, a transmit and receive channel assignment, a receive signal strength level of the wireless signal, a quality level associated with the wireless signal, a receive signal strength level of the interference blocker signal, a bandwidth of an operating band, a channel spacing, a list of internal receiver harmonic interference signals, a receiver selectivity and a receiver sensitivity.

9. The wireless receiver circuit of claim 1, wherein in response to the interference blocker signal detected by the second receiver and the interference blocker data provided to the multi-receiver control and interference detection logic by the second receiver, the multi-receiver control and interference detection logic provides a mitigation control signal to the first receiver to select at least one operating condition of the first receiver such that the selected at least one operating condition of the first receiver results in lower power consumption for the first receiver than a non-selected operating condition of the first receiver.

10. The wireless receiver circuit of claim 1, wherein in response to the interference blocker signal detected by the second receiver and the interference blocker data provided to the multi-receiver control and interference detection logic by the second receiver, the multi-receiver control and interference detection logic provides a mitigation control signal to the first receiver to select at least one operating condition of the first receiver such that a distortion level associated with the wireless signal received by the first receiver is reduced.

11. A wireless device comprising:

a wireless receiver circuit comprising:

an amplifier operative to receive a first modulation mode wireless signal, an interference product signal and an interference blocker signal;

a first modulation mode receiver operatively coupled to the amplifier to receive the first modulation mode wireless signal and the interference product signal;

a second modulation mode receiver operatively coupled to the amplifier to detect the interference blocker signal; and

multi-receiver control and interference detection logic, operatively coupled to the first modulation mode receiver and to the second modulation mode receiver to simultaneously control the second modulation mode receiver to detect the interference blocker signal while the first modulation mode receiver receives at least a portion of the wireless signal and the interference product signal, wherein in response to the interference blocker signal detected by the second receiver, the second receiver provides interference blocker data to the multi-receiver control and interference detection logic, and wherein in response to the interference blocker data provided to the multi-receiver control and interference detection logic by the second receiver, the multi-receiver control and interference detection logic adjusts at least one operating condition of the amplifier and of the first receiver such that the interference product signal received by the first receiver is reduced.

12. The wireless device of claim 11, wherein in response to the interference product signal detected by the first receiver, the first receiver provides first receiver data to the multi-receiver control and interference detection logic and, the multi-receiver control and interference detection logic provides an interference blocker search signal to the second modulation mode receiver to detect at least one interference blocker signal, wherein in response to the interference blocker data, the multi-receiver interface control and interference detection logic provides a mitigation control signal to the amplifier, and in response to the mitigation control signal, the amplifier adjusts at least one of a gain of the amplifier, a linearity of the amplifier and a bandwidth of the amplifier.

13. The wireless device of claim 11, wherein in response to the interference product signal detected by the first receiver, the first receiver provides first receiver data to the multi-receiver control and interference detection logic, and the multi-receiver control and interference detection logic provides an interference blocker search signal to

the second modulation mode receiver to detect at least one interference blocker signal, wherein in response to the interference blocker data, the multi-receiver interface control and interference detection logic provides a mitigation control signal to at least one of the amplifier and the first receiver, wherein in response to the mitigation control signal:

the amplifier adjusts at least one of a gain of the amplifier, a linearity of the amplifier, a bandwidth of the amplifier, and the rejection of the amplifier and

the first modulation mode receiver adjusts at least one of a gain of the receiver, a linearity of the receiver, a bandwidth of the receiver, and the rejection of the receiver.

14. The wireless device of claim 11, wherein the multi-receiver control and interference detection logic is operative to provide an interference blocker search signal to control the second receiver to detect a signal level at a frequency located in at least a portion of a frequency band by at least one of searching the frequency band and tuning to a candidate blocker frequency, such that the portion of the frequency band is eliminated as including the interference blocker signal if the detected signal level is below a threshold level, and the portion of the frequency band includes the interference blocker signal if the detected signal level is above the threshold level.

15. The wireless device of claim 11 further comprising:

an antenna operatively coupled to the amplifier to provide the first modulation mode wireless signal, the interference product signal and the interference blocker signal;

a first transmitter operatively coupled to the antenna to transmit a first modulation mode transmit signal and operatively coupled to provide first transmitter data including at least one of channel data, power level data, and frequency data to the multi-receiver control and interference detection logic; and

a second transmitter operatively coupled to the antenna to transmit a second modulation mode transmit signal and operatively coupled to provide second transmitter data including at least one of channel data, power level data, and frequency data to the multi-receiver control and interference detection logic.

16. A method for reducing signal interference in a wireless receiver circuit, the method comprising the steps of:

receiving a wireless signal and an interference product signal by a first receiver;

simultaneously controlling a second receiver to detect an interference blocker signal while the first receiver receives at least portions of the wireless signal and the interference product signal, if the first receiver detects a quality metric associated with the received wireless signal that exceeds a threshold; and

adjusting at least one operating condition of the first receiver to reduce the interference product signal received by the first receiver, based on the second receiver detecting the interference blocker signal.

17. The method of claim 16 further including:

detecting a second interference blocker signal by the second receiver and, in response, receiving interference blocker data from the second receiver; and

adjusting at least one of a first and a second operating condition of the first receiver in response to detecting the second interference blocker signal.

18. The method of claim 16 further including:

receiving a signal level by the second receiver at a frequency located in at least a portion of a frequency band, wherein the portion of the frequency band is eliminated as including the interference blocker signal if the detected signal level is below a threshold level, and the portion of the frequency band includes the interference blocker signal if the detected signal level is above a threshold level.

19. The method of claim 16 wherein at least one operating condition of the first receiver is at least one of a radio frequency operating condition, an intermediate frequency operating condition and a baseband operating condition.

20. The method of claim 16, wherein if the second receiver no longer detects the interference blocker signal, removing the adjustment of the at least one operating condition.

21. The method of claim 16, wherein adjusting the at least one operating condition of the first receiver is in response to the second receiver detecting the interference blocker signal and, in response to receiving at least one of a transmit power level, a transmitter activation indication, transmit and receive a channel assignment, a receive signal strength level of the wireless signal, a quality level associated with the

wireless signal, a receive signal strength level of the interference blocker signal, a bandwidth of an operating channel, a channel spacing, a list of internal receiver harmonic interference signals, a receiver selectivity and a receiver sensitivity.

22. The method of claim 16 including selecting the at least one operating condition of the first receiver in response to the detected interference blocker signal such that the selected at least one operating condition of the first receiver results in lower power consumption for the first receiver than would a non-selected operating condition of the first receiver.

23. The method of claim 16 wherein adjusting the at least one operating condition of the first receiver to reduce the received interference product signal based on the second receiver detecting the interference blocker signal includes:

receiving interference blocker data from the second receiver based on the second receiver detecting the interference blocker signal; and

providing a mitigation control signal to the first receiver to reduce the received interference product signal based on the second receiver detecting the interference blocker signal.

24. A memory containing instructions executable by one or more processing devices that causes the one or more processing devices to:

receive a wireless signal and an interference product signal by a first receiver;

simultaneously control a second receiver to detect an interference blocker signal while the first receiver receives at least portions of the wireless signal and the interference product signal, if the first receiver detects a quality metric associated with the received wireless signal that exceeds a threshold; and

adjust at least one operating condition of the first receiver to reduce the interference product signal received by the first receiver, based on the second receiver detecting the interference blocker signal.

25. The memory of claim 24 containing executable instructions that cause the one more processing devices to:

detect a second interference blocker signal by the second receiver and, in response, receive interference blocker data from the second receiver; and

adjust at least one of a first and a second operating condition of the first receiver in response to detecting the second interference blocker signal.